Amendments to the Claims

1. (Currently Amended) A method of reliably discovering devices and services with ad-hoc and server-based operation in a network environment of devices acting as discovery clients and discovery responders, the discovery responders each providing one or more services, at least some of the services being non-unique to a particular device, the method comprising:

detecting by a device operating as a discovery client whether a discovery server is present;

in a detected absence of any discovery server by said device, conducting discovery of services of discovery responders by said device operating as the discovery client as a multicast operation;

in a detected presence of any discovery server by said device, said device switching to a server-based discovery mode of operation in which said device operates by:

suppressing by said device when operating as the discovery client of its multicast operation and conducting discovery of services of discovery responders by said device when operating as the discovery client directed to the detected discovery server; and

continuing by said device when operating as one of the discovery responders to respond to multicast discovery only of ~~the~~ said device's own services ~~of the discovery responders~~ regardless of the presence or absence of the discovery server in the network environment.

2. (Original) The method of claim 1, wherein the detecting comprises sending by the discovery client of a discovery query as a multicast operation to find any discovery server in the network environment.

3. (Currently Amended) A method of reliable multicast suppression in service discovery on ad-hoc networks, comprising:

sending a multicast discovery query for discovery servers by a device acting as a discovery client on a network to find any discovery server present within a scope on the network;

receiving by said device acting as the discovery client any response to the multicast discovery query;

upon receiving a response of a discovery server to the multicast discovery query, said device switching to a server-based discovery mode of operation in which said device operates by suppressing sending further multicast discovery queries for device services by ~~the discovery client~~ said device and sending further discovery queries for device services by ~~the discovery client~~ said device directly to the discovery server, while the discovery server remains present on the network; and

in absence of any response to the multicast discovery query, sending the any further discovery queries for device services by the discovery client as multicast discovery queries on the network;

wherein said device when operating as a discovery ~~responders continue~~ responder when in the server-based discovery mode of operation continues to respond to multicast discovery queries only for device services matching ~~the respective discovery responders~~ said device's own services from ~~the~~ another discovery client irrespective of the discovery server being present on the network.

4. (Canceled)

5. (Currently Amended) A computing device operating as a discovery client in a network architecture for a discovery protocol capable of ad-hoc and server-based operation, the computing device comprising:

a memory storing software programming for an ad-hoc discovery protocol; and

a processor operating to execute the software programming in the memory;

wherein the software programming comprises:

programming code for switching the discovery client between server-based and ad-hoc discovery modes when a discovery server is determined to be present or absent, respectively, in a network in which the computing device is operating;

server-based discovery mode programming code for sending discovery queries of the discovery client for device services directly to the discovery server determined to be present in the network, while suppressing sending discovery queries via multicast transmission; and

ad-hoc discovery mode programming code for sending discovery queries of the discovery client for device services as a multicast transmission to discovery responders in the network; and

said server-based discovery mode programming code further ~~wherein the discovery responders are~~ configured to respond to the multicast transmission of the discovery queries ~~of the~~ by another discovery client for device services of the computing device only while ~~regardless of~~ the discovery server ~~being~~ is determined to be present in the network.

6. (Original) The computing device of claim 5, wherein the software programming further comprises programming code for detecting the presence or absence of a discovery server in the network.

7. (Original) The computing device of claim 6, wherein the programming code for detecting comprises programming code for sending a multicast discovery query to find discovery servers present in the network.

8. (Currently Amended) A computer-readable storage media having computer-readable software programming thereon for executing on a discovery client in a network architecture of a discovery protocol capable of server-based and ad-hoc discovery, the software programming comprising:

programming code for switching the discovery client between server-based and ad-hoc discovery modes when a discovery server is determined to be present or absent, respectively, in a network in which the computing device is operating;

server-based discovery mode programming code for sending discovery queries of the discovery client for device services directly to the discovery server determined to be present in the network and otherwise suppressing sending any discovery queries via multicast transmission; and

ad-hoc discovery mode programming code for sending discovery queries of the discovery client for device services as a multicast transmission to discovery responders in the network;

said server-based discovery mode programming code further ~~wherein the discovery responders are~~ configured to respond to the multicast transmission of the discovery queries ~~of the~~ by another discovery client for device services of the discovery client only while ~~regardless of~~ the discovery server ~~being~~ is determined to be present in the network.

9. (Previously Presented) The computer-readable storage media of claim 8, wherein the software programming further comprises programming code for detecting the presence or absence of a discovery server in the network.

10. (Previously Presented) The computer-readable storage media of claim 9, wherein the programming code for detecting comprises programming code for sending a multicast discovery query to find discovery servers present in the network.

11. (Currently Amended) A distributed system of networked computing devices compliant with an ad-hoc service discovery protocol, the distributed system comprising:

at least one networked computing device operating as a discovery client according to a network architecture of the ad-hoc service discovery protocol, the discovery client having a server-based discovery mode and an ad-hoc discovery mode, the discovery client operating to determine whether any discovery server is present or absent in a network and switch to the server-based discovery mode or ad-hoc discovery mode, respectively, according to the determination, the discovery client operating in ad-hoc discovery mode to send discovery queries for device services as multicast transmissions and operating in server-based discovery mode to suppress multicast transmission of discovery queries for device services by the discovery client; and

at least one networked computing device operating as a discovery responder with device services according to the network architecture of the ad-hoc service discovery protocol, the discovery responder operating regardless of said discovery responder having detected the presence ~~or absence~~ of a discovery server in the network to respond to multicast transmissions of discovery queries only for device services matching the device services of the discovery responder itself.

12. (Previously Presented) The distributed system of claim 11 wherein the discovery client has a configured mode, the discovery client operating in the configured mode to suppress multicast transmission of discovery queries by the discovery client and send such discovery queries directly to a specified discovery server specified in its configuration.

13. (Previously Presented) The distributed system of claim 11 wherein the discovery responder has a configured mode, the discovery responder operating in the configured mode to suppress response to multicast transmission of discovery queries.

14. (Currently Amended) A method of discovering controllable device services in ad-hoc and server-managed networks of computing devices, the method comprising:

when connected in an ad-hoc network, sending discovery queries for device services as a multicast transmission from a discovery client computing device;

when connected in a server-managed network having a discovery server, sending discovery queries for the device services from the discovery client computing device as a directed transmission to the discovery server using a networking protocol that guarantees message delivery while suppressing sending any discovery queries via multicast transmission; and

responding by the discovery client computing device to only those discovery queries for the device services received as multicast transmissions by a the discovery client computing device that match device services of the discovery client computing device ~~regardless of whether connected in the ad-hoc or~~ when the discovery client computing device is connected in a server-managed network.

15. (Canceled)

16. (Original) The method of claim 14 wherein the networking protocol is the transmission control protocol (TCP).

17. (Currently Amended) A computer-readable storage media having a software program thereon executable on a computing device to perform a method of discovering device services in ad-hoc and server-managed networks of computing devices, the method comprising:

when the computing device is connected in an ad-hoc network, sending discovery queries for device services as a multicast transmission from the computing device; and

when the computing device is connected in a server-managed network having a discovery server, sending discovery queries for the devices services from the computing device directly to the discovery server using a networking protocol that guarantees message delivery while suppressing sending any discovery queries for devices services as a multicast transmission; and

responding to only those discovery queries for the device services received as multicast transmissions ~~by a discovery responder~~ that match device services of the computing device itself ~~regardless of whether~~ when the computing device is connected in the ~~ad-hoc or~~ server-managed network.

18. (Previously Presented) The computer-readable storage media of claim 17 wherein the networking protocol is the transmission control protocol (TCP).

19. (Currently Amended) A computing device for discovering device services of discovery responders in ad-hoc and server-managed networks of computing devices, the computing device comprising:

means for, when connected in an ad-hoc network, sending discovery queries for device services of the discovery responders as a multicast transmission from a discovery client computing device; and

means for, when connected in a server-managed network having a discovery server, switching by the computing device into a server-based discovery mode wherein the computing device operates by sending discovery queries for the device services of the discovery responders from the discovery client computing device as a directed transmission to the discovery server using a networking protocol that guarantees message delivery while suppressing sending any discovery queries via multicast transmission, and further by responding to only those discovery queries sent from other discovery clients via multicast transmission that seek discovery of device services of the computing device itself;

wherein the discovery responders continue to respond to multicast transmission regardless of whether the discovery responders are in ad-hoc or server-managed networks of computing devices.

20. (Original) The computing device of claim 19 wherein the networking protocol is the transmission control protocol (TCP).

21-55. (Canceled)